
Coastal Resource Management Element





COASTAL RESOURCE MANAGEMENT ELEMENT

Introduction

This element of the General Plan/Coastal Land Use Plan includes policies for protection of the City's coastal environmental resources including the character of its forest, beach and bluffs, water quality and Environmentally Sensitive Habitat Areas (ESHAs). As noted in the previous element (Access and Recreation), there is little private land located between the first public road and the shoreline. The City owns nearly the entire beach. This eliminates many of the potential conflicts that other communities face between development and resource preservation objectives along the immediate coastline. However, the City's biological resources are found in a variety of other locations, and require protection under the Coastal Act. (LUP)

Coastal Resource Management Background

Environmental Setting

The City of Carmel-by-the-Sea is located in a region of California's central coast that is known for its diversity of plants and plant communities. The region surrounding the city supports several different climatic, topographic, and soil conditions, resulting in a wide variety of habitats. This diversity of conditions supports many native plants and wildlife species. As an example of this diversity, 146 plant species reach their most southern and 156 plant species reach their most northern distributional limits in Monterey County, and at least 34 plant species are found only in Monterey County. (LUP)

Residential development occurs on almost all land in the city, except for seven parks, several mini-parks, a compact centralized commercial area and some privately owned parcels in Pescadero Canyon. Approximately 68 acres of public open space and approximately 10 acres of privately owned undeveloped land are under the City's jurisdiction. Most of the parks in the City are developed to support passive and active recreational activities. Of the City's public lands, Carmel Beach, Mission Trail Nature Preserve, and the proposed Rio Park (outside City boundaries), support the most intact and highest quality natural resources. The lower portion of Forest Hill Park also supports natural habitat but has been substantially altered by past activities and continues to be maintained for public recreational uses. The privately owned properties in Pescadero Canyon are part of a larger watershed for Pescadero Creek that extends into Del Monte Forest and supports Monterey Pine forest. (LUP)

The landform of the Monterey Peninsula is an ascending staircase or series of six marine terraces of increasing geologic age, rising inland from the seashore. These marine



terraces reflect the changes in sea level and the general uplift of underlying bedrock along the central coast in roughly the last half-million years or more. The city is built on the first five of the six marine terraces. The marine sediment of the first four terraces is covered by sand dunes, which also are of increasing age with ascending elevation and distance from the ocean. The greater degree of soil development in the older dunes, such as organic matter accumulation, and clay and iron weathering and translocation to the subsoil, reflect the age of the dunes. (LUP)

Drainages have cut through the dunes and marine terraces of Pescadero Canyon and Mission Trail Nature Preserve to expose the underlying bedrock. Shale from marine deposits is exposed in Pescadero Canyon, and granitic bedrock is exposed in the lower slopes and stream channel in Mission Trail Nature Preserve. Uplifted alluvial terraces formed by the Carmel River are found along the southern boundary of the City. (LUP)

Carmel Bay is a 2.8-mile-wide open bay between Cypress Point on the north and the outer tip of Point Lobos, on the south. Its sands are very white, extending out below its clear waters. The deep Carmel Offshore Canyon is located in the southeast part of the bay, with depths of 300 feet less than 0.2 miles from San Jose beach, a part of Carmel River State Beach. The public beach of Carmel-by-the-Sea is on the more gently sloping northeast shore of the bay, north of Carmel River and the promontory now known as Carmel Point. Gentle as Carmel Beach is, it is still considered by coastal geologists to be in the category of "steep" beaches. Ten-foot breakers are not unusual. About one mile in length, covering about 22 acres it is under the jurisdiction of the City. The beach is a commons held in public trust and wholly devoted to public access and the enjoyment by residents and visitors alike. The lower beach near the water is managed as a natural environment. The sand builds 200 feet seaward during summer when waves are small, then retreats toward the bluff, almost to the vanishing point as the large waves of winter storms strip sand from the beach. (LUP)

The sand supply within Carmel Bay may be a closed system. One study suggests that Carmel Beach does not receive any significant sand transport northward from Carmel River beach around Carmel Point within the bay⁷. Sediment also does not appear to be transported with the northwest drift around the Monterey Peninsula from the southern part of Monterey Bay. Carmel, like many other small embayments along the West Coast, appears to derive most of its sand, not from rivers, but from the erosion of adjacent headlands and shoreline bluffs. (LUP)

⁷ C.D. Storlazzi, M.E. Field/Marine Geology 170 (2000) 289-316.



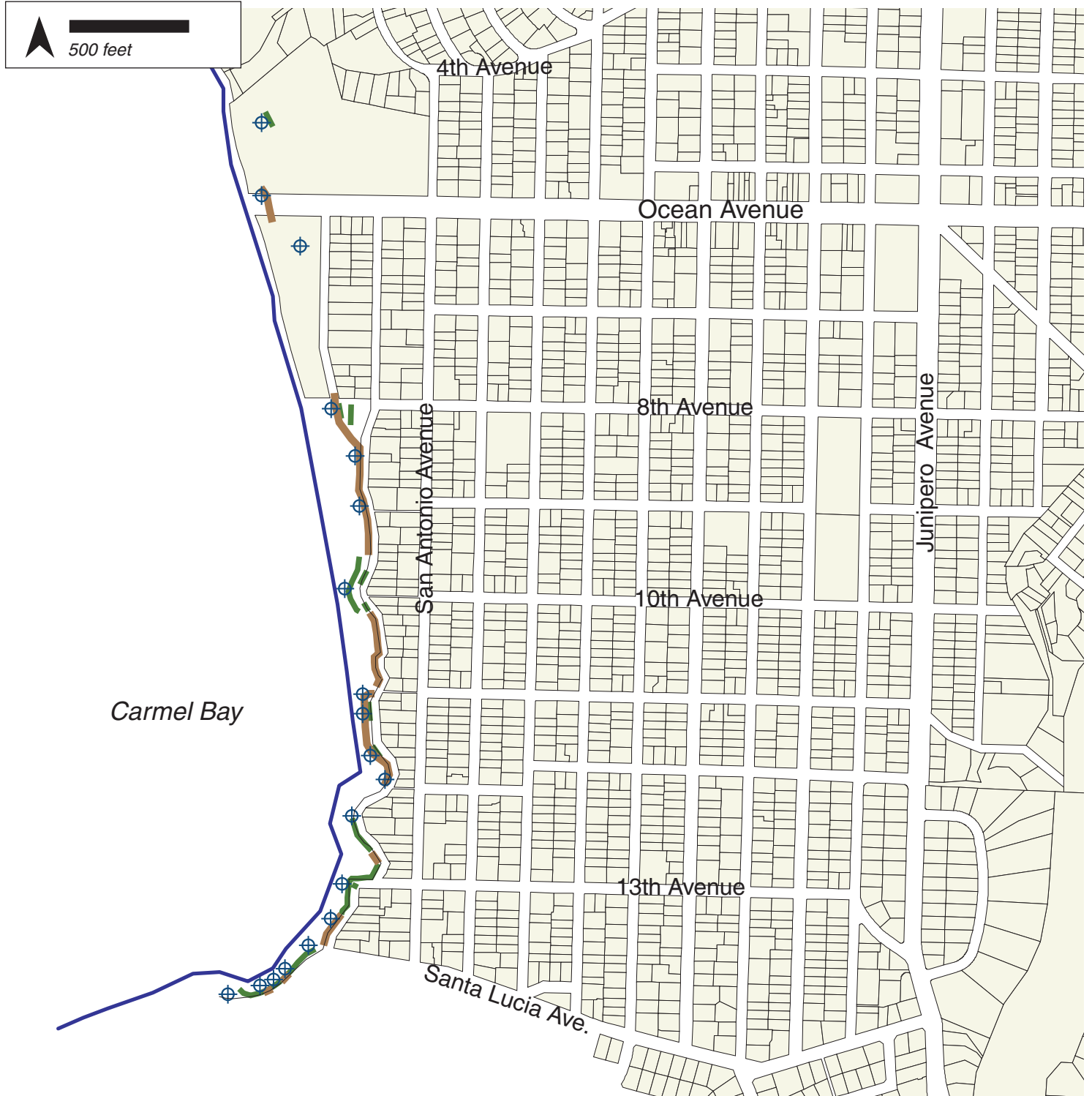
Cypress Point, the western-most point of the Monterey Peninsula, extends about 2 miles beyond the general trend of the coast. South of it, enclosing the anchorages and beaches of Pebble Beach and Stillwater Cove, is Pescadero Point. Since the prevailing swell and long shore currents come from the northwest, it is the Santa Lucia granodiorite of these headlands that is slowly eroded and transported by waves to line the Carmel shoreline with white sands. This quartz sand is so fine that it was mined in earlier days for use in the making of glass. (LUP)

The shale, sandstone, and lava rock of the bay bluffs, being softer and less resistant than the granite rocks, also contribute material to the sandy beaches. Since these bluffs are so vulnerable, the City of Carmel-by-the-Sea began in the 1950s to build seawalls to protect them. When heavy winter storms combine with the year's highest tides, the beach is sometimes completely inundated. Waves crash against the bluffs and seawalls, and debris has at times been thrown into the air and across Scenic Road. Figure 5.1 shows public coastal protection structures to be maintained. These include seawalls and engineered revetments that protect the bluff from wave attack and storm water outfalls that direct runoff away from fragile bluff soils to prevent erosion. Figure 5.2 shows the location of sand redistribution activity historically undertaken by the City. In each of the areas shown on the map, sand is moved upslope from just above mean high tide line toward the base of the bluffs to cover exposed revetments and to restore beach sand levels worn down from wave activity and from daily use by the public. (LUP)

Beach Maintenance and Shoreline Protection

Public access to Carmel Beach is primarily from the parking area at the foot of Ocean Avenue as well as from numerous sites along Scenic Road. But from these locations, access to the tide line requires a descent that ranges between 12 and 50 feet, depending on location and season. During several months of the year, high-energy (storm) waves scour sand from the beach, exposing an underlying base of large sandstone outcroppings. These conditions often make beach access difficult. During some periods, storm-generated waves strike directly against the dunes, bluffs and beach access stairways, making beach access dangerous. And, like nearly all open-coast locations, the Carmel shoreline appears to be facing a future of rising sea levels and unpredictable weather patterns. (LUP)

If left unmanaged, the bluffs surrounding Carmel Bay would progressively erode from the impact of winter storm waves, surface drainage and other steady and episodic erosion processes. This natural process would eventually erode the bluffs up to the City's beach access stairways and the Beach Bluff Pathway. Eventually, Scenic Road and the adjacent homes would be threatened as well. Erosion of Carmel's bluffs is quite variable along the shoreline and includes both steady erosion and episodic events. Large, unprotected



Legend

	Engineered Rock Revetments
	Seawalls/Retaining Walls
	Stormwater Outfalls

Figure 5.1
**Public Coastal
Protection Structures**



Legend


 Sand Redistribution Sites

Figure 5.2
Sand Redistribution Sites



sections of the bluff subject to wave attack can slough away during heavy surf and winter storms. The same area of bluff may not retreat again for decades. Estimates of the long-term average rate of bluff retreat were performed in 1984 by reviewing old surveys and old aerial photographs. Based on data from 1908 to 1983, bluff retreat rates along Carmel Beach were estimated at between 4” and 8” per year depending on location. Much of this retreat occurred during the single winter of 1982-83 when twenty to forty feet of land between Scenic Road and the bluff’s edge were lost to the sea. (LUP)

Carmel has forestalled this process by modifying the bluffs to resist erosive forces thereby protecting public access as well as public and private improvements. This began with construction of the first seawalls in about 1958. Additional seawalls were added in 1976, 1978, 1982 and 1984, and 2001. By the end of the twentieth-century nearly the entire coastline south of Ocean Avenue was armored by a combination of vertical seawalls, vertical or stepped retaining walls or engineered rock revetments (see Figure 5.1). Drainage improvements also have been installed to divert storm water away from the fragile bluffs. The City has avoided the use of unconsolidated rip-rap which is unsightly and less effective. Through its beach management program, the City annually moves thousands of yards of sand to cover its engineered revetments and maintain ramps to improve beach safety, access, and aesthetics for beach-users. (LUP)

As Carmel has built seawalls, retaining walls, and engineered rock revetments in a continuing program to protect the City’s shoreline bluffs and public amenities along its bluff tops, including the Beach Bluff Pathway, the City has worked to mitigate negative impacts (structural, functional, and visual) that often result from the use of hard protective structures along the shore:

- Seawalls and Retaining Walls – These are vertical walls that hold the bluff in place and are exposed to waves on the seaward side. To reduce the visual impact of these structures, the City has covered them all with a facing of “golden granite” rock, giving the walls a more “natural” look. It is unclear whether the accelerated loss of beach sand that is often associated with seawall construction is occurring along Carmel Beach. Further long-term study of beach levels is warranted to provide the best management for Carmel’s beach. When new protective structures are proposed in areas not previously armored, seawalls are generally considered the preferred alternative unless site-specific engineering reasons dictate otherwise. This is because seawalls take up less beach area and typically do not require annual sand redistribution to cover their bases. (LUP)
- Revetments – These are engineered assemblies that begin with an underlayment of filter fabric placed against the slope of the exposed bluff. This is then covered by



core-stones (400 to 600 lbs. each) faced with interlocked armor-stones (5 to 6 tons each). These engineered assemblies are sloped back along the inclined bluffs to shield them from wave attack. To mask any intrusive impact, nearly all engineered revetments installed since 1983 have been covered with local soils, then with beach sand, and then, replanted with vegetation. During the beach's peak visitor period (mid-Spring through mid-Fall), most of the revetments are so well covered that they are virtually indistinguishable from other portions of Carmel's beach and bluffs. Further, the City's beach management program directs the Forest and Beach Department's personnel to annually contract sand bulldozing from the lower beach to the upper beach, thoroughly covering exposed revetment structures. (LUP)

Most visitors to Carmel's picturesque beach are unaware of this armoring because of the care taken to disguise the structures with soil, sand and landscaping. Policies in this plan support these past practices that combine engineered structures, sand management, and the preservation of beach aesthetics. (LUP)

The City's Shoreline Management Plan includes a monitoring program to gauge the long-term effect of shoreline structures and directs the Forest, Parks and Beach Department's personnel to evaluate the impacts to marine and terrestrial resources of annually bulldozing sand from the lower beach to the upper beach. In the future, when existing structures fail and need to be replaced or substantially rebuilt, the data collected through the monitoring program will aid the City in determining the best design approach, to take in balancing protection of coastal resources, public access, public safety, aesthetics and engineering. (LUP)

The Shoreline Management Plan serves as a comprehensive document that will guide future management of the City's shoreline area, including beaches, dunes, bluff, landscaping, and associated infrastructure. Updates to the Shoreline Management Plan will be made periodically as new information and our understanding of shoreline processes, marine and terrestrial resources, and the coastal environment evolve. (LUP)

Urbanized Forest, Parks and Open Spaces

Since the early 1900s Carmel's forest has been carefully nurtured and enhanced. Monterey pines, Coast Live oaks and other trees were often planted when lots were first sold or developed in an effort to extend the forest cover and range. Over time, the resident's ongoing interest in the forest and natural environment resulted in the adoption of ordinances, resolutions, policies and a Master Plan relating to trees. Taken together, these documents have successfully guided the City's tree program over the years. However, since the measures were adopted at different times to address separate concerns, they lacked a sense of overall cohesion. In order to meld these documents together, the first Forest Management Plan for the City of Carmel-by-the-Sea was



adopted in 1971. In early 2001, the City updated the Forest Management Plan and incorporated it into the Local Coastal Program. (LUP)

Carmel's forest is an “urbanized” Monterey pine forest rather than an “urban” forest. “Urban” forests are planted after development and typically consist of single species, regularly spaced trees planted in a row between the sidewalk and the street. An “urbanized” forest exists before development and is characterized by its diversity in species, age and randomness in tree location resulting in meandering streets of varying width. (LUP)

To many, the “urbanized” forest is *the* character-defining feature that makes Carmel-by-the-Sea so unique. The forest, along with the beach and ocean, is the City’s largest and most visible natural resource. Homes are nestled into the native Monterey pine and Coast Live oak on a grid of streets that yields to trees more than to engineering expediency. Upper canopy trees impart a distinctive ambiance and identity to the City. Lower canopy trees soften and provide screening of development. Together the mix of upper and lower canopy trees establishes a powerful sense of place. (LUP)

In a city with few formal street improvements or drainage systems, the “urbanized” forest also serves to convey runoff from the watershed to the beach and Carmel Bay through a variety of natural drainages, swales, and creeks. The forest performs the important functions of absorbing water from the soil, reducing runoff, filtering pollutants, and minimizing erosion. As such, the “urbanized” forest reduces the amount of polluted runoff and in large part, helps the City comply with the National Pollutant Discharge Elimination System (NPDES) Phase II Storm Water permit regulations. (LUP)

In recent years, the Monterey Pine forest has suffered from a severe outbreak of pitch canker disease spreading throughout much of the City. The initial findings of a survey of the east side of town (east of Junipero Avenue) revealed that 50% of Carmel’s pines were infected with pitch canker and 2% of the standing trees were dead. The City has responded in the past by removing dead and dying trees and disposing of the infected materials. During the years of 1999 to 2001, the Forestry Department removed roughly 180 pitch canker-infected pines. Roughly 70% of those trees (125) were young trees 12” or less in diameter. Up to 70% of the younger trees east of Junipero Avenue now appear to be infected. Older trees are less susceptible to infection and only 30% of these are infected. (LUP)

The City’s Forest, Parks and Beach Department has an ongoing program of replacing dead and diseased pines on public property. The City also has been working on developing a disease-resistant pine and has been successful in planting 15 pines that have so far proved to be completely resistant to the disease. However, the loss of Monterey Pines due to pine pitch canker and other causes on private property continues to be an issue. (LUP)



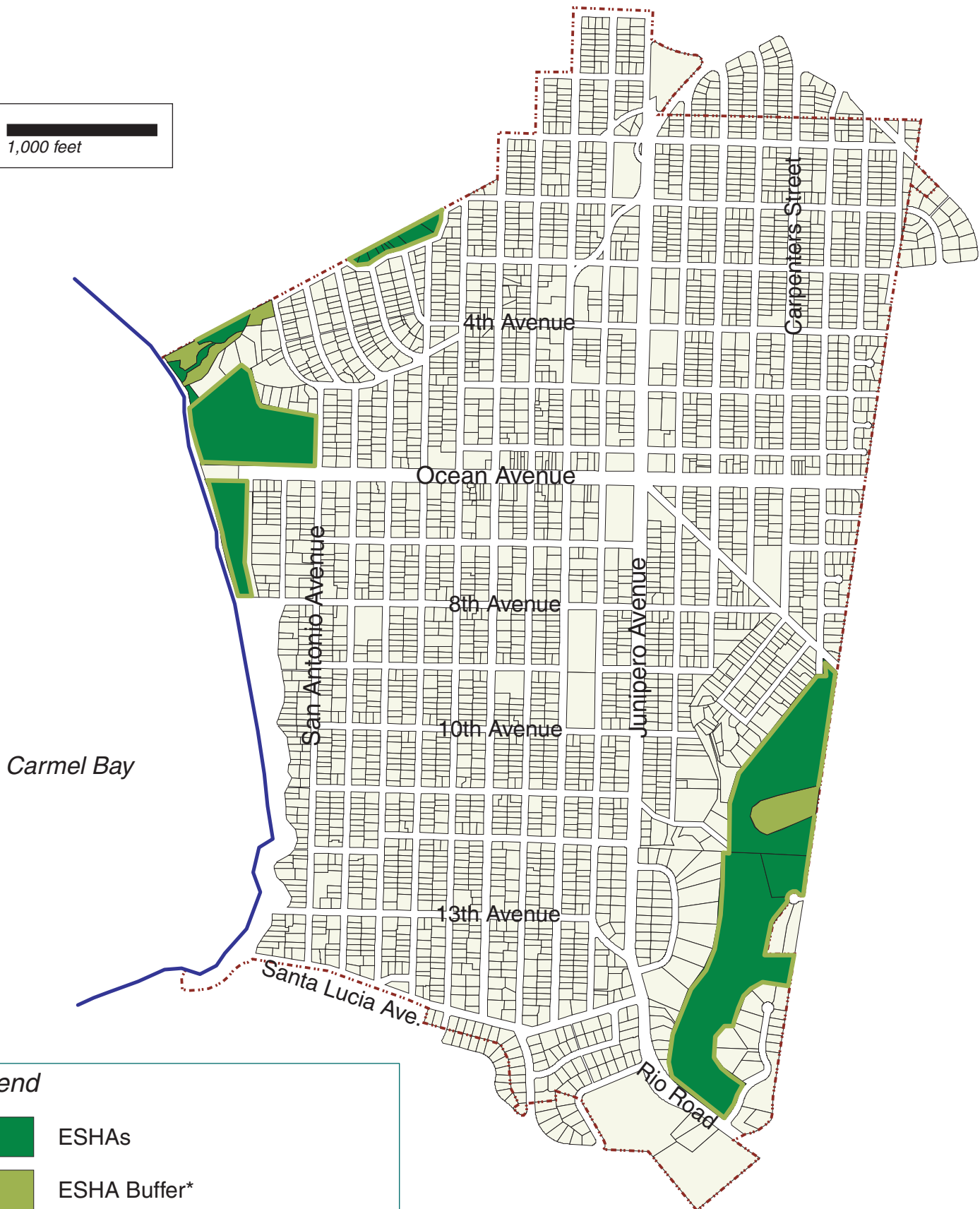
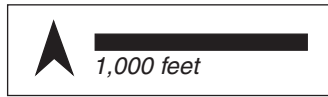
The City of Carmel maintains an ongoing survey of trees by species and size, started in 1971. Since that time, the numbers of Monterey pines on public property declined roughly 2%, while the decline on private property has reached 10%. It is unclear whether pine pitch canker is entirely responsible for the decline on private property; there are many other factors including disease, development impacts, and old age. Though many large mature trees can probably survive pitch canker, given the age of the City's Monterey pine forest, coupled with the susceptibility of young trees to the disease, the overall health of the City's pine forest may be in jeopardy. As the number of Monterey Pines declined since 1971, the number of Coast Live Oaks increased 17% on private property and 40% on public property. The increase in oaks, dramatic as it may be, cannot offset the loss of Monterey pines, which impart a very different sense of place for the village. (LUP)

Steps must be taken to minimize the threat to existing healthy Monterey pines and new seedlings to ensure continued diversity in species, age, and location. This document includes policies to respond to this issue. Disturbance and/or removal of mature and disease resistant trees during construction or other development activities should be avoided. Permit conditions requiring replacement trees for those removed from private land should be monitored and enforced to ensure that the trees are healthy and reach maturity. Replacements should also be in like kind. It is essential that these and other policy directives be carried out to ensure that the Monterey pine forest landscape is protected so that the forested character of this unique coastal village is preserved. (LUP)

Environmentally Sensitive Habitat Areas

In addition to the urbanized Monterey pine forest, the City of Carmel-by-the-Sea has other environmentally sensitive habitats including wetlands, riparian forest, wet meadow, and coastal terrace prairie. In 1995, the City completed a detailed study of environmentally sensitive habitat areas (ESHAs) (Jones & Stokes, 1995), which includes specific recommendations for City policies and practices. Relevant policies and recommendations derived from this document are incorporated into this section of the Land Use Plan. Figure 5.3 shows a map of the currently designated ESHA's. The location and types of ESHAs found in Carmel include:

- Pescadero Canyon supports Monterey pine forest that provides watershed protection and a buffer for Pescadero Creek and is part of an important local wildlife habitat corridor, wetland drainage (Pescadero Creek), central coast arroyo willow riparian forest, and wet meadow. (LUP)
- Mission Trail Nature Preserve supports Monterey pine forest; central coast arroyo willow riparian forest along wetland drainages; coastal terrace prairie; wet meadow; and known occurrences of special-status plant and wildlife species,



Legend

- ESHAs
- ESHA Buffer*
- City Limits

* Note: A 30 foot buffer is required contiguous to all ESHAs.

Figure 5.3
**Environmentally Sensitive
 Habitat Areas (ESHAs)**



including Hickman's onion, and Monterey dusky footed woodrat, which are state and/or federal species of special concern, as well as potential habitats for other special-status species. (LUP)

- Carmel Beach supports dune scrub; un-vegetated dunes; a known occurrence of Tidestrom's lupine, a state- and federal-listed endangered species, black legless lizard, a state species of special concern and other potential habitat for other special-status species. (LUP)

A brief description and management guidance for these resources follows:

Pescadero Canyon. Pescadero Canyon, located along the northern boundary of the City, supports two undeveloped segments referred to as Pescadero Canyon East and Pescadero Canyon West. These two segments are part of the larger Pescadero Canyon that extends to the northeast beyond the City's jurisdiction. Pescadero Canyon supports Monterey pine forest along its slopes and riparian and wetland habitat at the bottom of the canyon along Pescadero Creek. Most of Pescadero Canyon is in private ownership and supports some residential development. (LUP)

The Pescadero Creek watershed begins on marine terrace 6 at the top of Huckleberry Hill and extends down through a succession of geomorphic surfaces to the Pacific Ocean. This succession of marine and dune-covered terraces can be observed along the steep canyon walls. Exposed in the canyon bottom and adjacent side slopes are the soils and shale bedrock of the Monterey formation. (LUP)

Under natural conditions, a high rainfall runoff rate and consequent high discharge into Pescadero Creek would be expected on the Narlon soils of the marine terraces. The natural runoff rate and stream flows in Pescadero Creek have increased beyond natural conditions with development in the Pescadero Creek watershed. (LUP)

Pescadero Canyon East supports Monterey pine forest along the steep slopes of the canyon. Wetland drainage and two small, planted redwood groves can be found at the bottom of the canyon. Monterey pine forest in Pescadero Canyon East can be found on middle-aged dunes and on shale bedrock. Within this part of the Canyon, Monterey pine forest on middle-aged dunes is dominant occurring on the upper north-facing slope of Pescadero Canyon, along 2nd Avenue. Monterey pine forest on shale bedrock forms a narrow band on both sides of the Creek. Pescadero Canyon East is traversed by a perennial drainage that conveys runoff from the upper reaches of Pescadero Canyon to Carmel Bay. The drainage bottom varies from 3 to 6 feet wide and is generally un-vegetated. Wetland plants occur sporadically along the drainage edge. No special-status species have been found in Pescadero Canyon East. (LUP)



Pescadero Canyon West is characterized by less extreme slopes than are found in the eastern part of the canyon. This flatter area supports a mosaic of wetland drainage, central coast arroyo willow riparian forest, wet meadow, and mixed horticultural species. Pescadero Creek terminates at the western edge of Pescadero Canyon West. In this area of the canyon the creek supports dense riparian forest and wet meadow along its banks. Central coast arroyo willow riparian forest occurs as a dense multi-layered forest at Pescadero Canyon West, adjacent to Pebble Beach Golf Course. The riparian forest canopy and sub-canopy are dominated by arroyo willow with interspersed dogwood. A mix of native and non-native species characterizes the under-story. Wet meadow also occurs in Pescadero Canyon West, along the southern side of the perennial drainage. The 750-square-foot wet meadow area supports sedge, panicked bulrush and horsetail. (LUP)

Management guidelines for Pescadero Canyon should be implemented that respond to the following issues of slope and channel stability, habitat enhancement and control of invasive vegetation:

- Reduce erosion and sedimentation into the creek channel and Carmel Bay
- Remove accumulated debris from the creek channel
- Minimize vegetation removal that could destabilize slopes
- Prohibit removal of native vegetation from riparian forest and Monterey pine forest habitat.
- Avoid the introduction and control or reduce the spread of invasive horticultural species
- Require mitigation of impacts associated with development in or near the canyon
- Avoid impacts to wet meadow and other wetland habitat types within Pescadero Canyon East and West and any other environmentally sensitive habitat areas. (LUP)

Mission Trail Nature Preserve.

Mission Trail Nature Preserve lies along much of the City's eastern boundary and is the largest ESHA in the City. It contains a wide variety of habitat types. To describe this area the Preserve is divided into four planning units: Martin Road Parcel, Park Proper, Flanders Mansion/Rowntree Native Plant Garden and Outlet Meadow. The Preserve supports a vegetation mosaic consisting of Monterey pine forest on inland granitic bedrock and oldest dunes, central coast arroyo willow riparian forest, wetland drainage, wet meadow, coast live oak woodland, coastal terrace prairie and horticultural plantings. (LUP)



- Martin Road Parcel supports coastal terrace prairie and a population of Hickman's Onion (a federal species of concern).
- Park Proper supports Monterey pine forest on inland granitic bedrock and oldest dunes, central coast arroyo willow riparian forest, wetland drainage, Cottonwoods and coast live oak woodland that is suitable habitat for Monterey dusky-footed woodrat, a federal and state species of special concern.
- Flanders Mansion/Rowntree Native Plant Garden supports Monterey pine forest on inland granitic bedrock with horticultural plantings.
- Outlet Meadow supports central coast arroyo willow riparian forest, wetland drainage, wet meadow, coastal terrace prairie, and Coast Live oak woodland. (LUP)

Monterey pine forest on inland granitic bedrock is dominant in the Preserve. One small area of Monterey pine forest on oldest dunes occurs in the northern corner of the Preserve. Only 20 percent of the historical extent of Monterey pine forest on oldest dunes remains on the Monterey Peninsula. In general, the Preserve supports mature large Monterey pine with a sub-canopy layer of Coast Live oak and a dense under story of shrub, vine, and herbaceous species. (LUP)

Oak woodland, coastal terrace prairie and several riparian/wetland habitat types complete the mosaic found in the Preserve. A small area of coast live oak woodland occurs in the southeastern corner of the Preserve. The woodland is characterized by a closed canopy of Coast Live oaks with an under story of coyote bush, California blackberry, poison oak and herbaceous species. Coastal terrace prairie occurs along west-facing and south-facing slopes in the Martin Road Parcel and Outlet Meadow units. These sites appear to occur on old alluvial terraces of the Carmel River. Coastal terrace prairie typically occurs within the zone of coastal fog incursion, on sandy loam. Most stands are patchy and variable in composition, reflecting local differences in available soil moisture capacity. (LUP)

Saturated soils and flowing water have been observed at the upper edge and lower bottom of the coastal terrace prairie. The presence of this wetland hydrology and a prevalence of hydrophytic wetland plants indicate that part of the coastal terrace prairie may qualify as jurisdictional wetland under section 404 of the Clean Water Act and the Coastal Act. (LUP)



Two main perennial drainages and several smaller drainages transect the Preserve. The main perennial drainage enters the Preserve at its northern end, runs along its western boundary and forks near the center of the Preserve. At the north end this drainage is generally un-vegetated. The steep bank sides are vegetated with Monterey pine and coast live oak with a dense under story of shrubs and vines. French broom dominates the banks along the northern portion of the drainage, grading into a dense central coast arroyo willow riparian forest (near the Eleventh Avenue entrance to the Preserve at Willow Trail). Another perennial drainage feeds into the Preserve from the east, supporting a dense central coast arroyo willow riparian forest. (LUP)

Central coast arroyo willow riparian forest occurs as a dense, multi-layered forest along the northern boundary of the Preserve. As mentioned above, riparian forest also occurs along a perennial drainage near the western boundary of the Preserve. The riparian forest is characterized by a canopy layer of black cottonwood and arroyo willow with a sub-canopy layer of shrub-size arroyo willow and dogwood. In localized areas, invasive horticultural species form a conspicuously dense under-story in the forest and have displaced desirable native riparian species. (LUP)

Special-status species have been found in the Preserve, including Hickman's onion, a federal species of concern and included on California Native Plant Society (CNPS) List 1B, which includes plants considered by CNPS to be rare, threatened, or endangered in California and elsewhere due to their limited or vulnerable habitat, their low numbers of individuals per population, or their limited number of populations. Federal species of concern are not listed or candidates for listing as threatened or endangered, and they have no formal protection under the Federal Endangered Species Act. The designation merely indicates that U.S. Fish & Wildlife Service (USFWS) is concerned about these species. (LUP)

Hickman's onion is known from fewer than twenty populations and is threatened by urbanization, grazing, road construction and military activities. A nearby occurrence of Hickman's onion was previously identified along the south side of Hatton Road just east of Mission Trail Nature Preserve (Department of Fish and Game, Natural Diversity Database, 1994). A new population within the Preserve was found during field surveys in 1995 along the upper eastern edge of the coastal terrace prairie (Jones and Stokes, 1995). This population contains approximately 100-150 individual plants. The area that supports Hickman's onion is maintained by mowing each year. The overall effects on the population from this maintenance activity are unknown and should be assessed through monitoring efforts. Although no other special-status plant species have been located in the Preserve, suitable habitat was identified for several late-blooming species including Gairdner's yampah and Seaside bird's beak. (LUP)



The presence of one special-status wildlife species, the Monterey dusky-footed woodrat, a federal and state species of special concern, was observed during fieldwork in the Preserve (Jones and Stokes, 1995). As with federal species of concern, state species of special concern are not listed or candidates for listing as threatened or endangered and have no formal protection under the State Endangered Species Act. The designation merely indicates that California Department of Fish and Game (DFG) is concerned about these species and that special consideration should be taken when decisions are made regarding the future of an area containing these species. (LUP)

Two woodrat nests were observed on the eastern edge of the Preserve and several nests were seen in the Outlet Meadow area. The nests had obvious entrance and exit holes that showed evidence of use and appeared active. Because of the relatively large size and isolation of the Mission Trail Nature Preserve, it has the greatest potential ecological value of all the habitats studied in the City. The dense riparian areas provide potential habitat for yellow warbler. The fairly frequent downed and decomposing logs could potentially be used by the Monterey ornate shrew. Sharp-shinned hawks and Cooper's hawks could use the Monterey pine forest for foraging and nesting. (LUP)

Management guidelines for Mission Trail Nature Preserve should be implemented that respond to the following issues of habitat quality and enhancement and control of invasive vegetation:

- Reduce erosion and loss of native coastal terrace prairie vegetation
- Enhance the habitat value of the coastal terrace prairie
- Monitor and protect the Hickman's onion population
- Maintain and enhance habitat for the Monterey dusky-footed woodrat
- Prohibit removal of native vegetation from riparian forest habitat
- Reduce the introduction and spread of invasive horticultural species
- Survey for special status plants periodically and manage as appropriate. (LUP)

Carmel Beach and Shoreline.

The white sands of Carmel Beach form the entire western boundary of the City. Although largely un-vegetated, Carmel Beach does support scattered areas of native dune scrub and



horticultural plantings. Native dune scrub occurs near the corner of Ocean and San Antonio Avenues in the North Dunes area. Species observed in this scrub habitat during the field survey include mock heather, bush lupine, beach sagewort, California blackberry, beach evening primrose, pink sand verbena, croton, California sea rocket and ice plant. Coast Live oaks are scattered in the dune scrub. Horticultural plantings occur in scattered locations along the bluffs of the Carmel shoreline. One grove of Monterey Cypress occurs along Ocean Avenue, near the dune scrub. (LUP)

Tidestrom's lupine can be found in and near the dune scrub habitat in the north dunes at Carmel Beach. Tidestrom's lupine is a state and federal listed endangered species and is on list 1B of the CNPS. This is a perennial herb that typically occurs in coastal dune habitat. The species is seriously threatened by coastal development, trampling, and competition from invasive, non-native plants. The Carmel dunes population is a new occurrence first reported in 1995 and contains approximately 280 individual plants (Jones and Stokes, 1995). Other populations nearby can be found at Asilomar State Beach and at several locations in Pebble Beach. At Carmel, the plant is associated with beach sagewort, mock heather, beach evening primrose, bush lupine and wildrye. While the local population appears viable the habitat conditions for Tidestrom's lupine is degraded from public use and the spread of invasive non-native species. No other special-status plant species have been reported but the habitat is suitable for one-awned spineflower, robust spineflower, and beach layia. (LUP)

In this area, black legless lizard, a State species of special concern, has been reported as well. Twelve of these lizards were captured in the dunes along the Carmel shoreline in 1984 during a USFWS study (Bury 1985). Currently, potential habitat for black legless lizards exists in the eastern portion of the north dunes area where a small pocket of native dune vegetation exists. Frequent human use of the area and encroachment of non-native species such as ice plant reduce the area's value for legless lizard. The potential for these lizards to still occur along Carmel's shoreline is considered moderate. No other special-status wildlife species are expected to occur along the shoreline. (LUP)

ESHA Management guidelines for the Carmel shoreline should be implemented that respond to the issues of habitat quality enhancement and control of invasive vegetation:

- Restore, enhance and protect the dunes to improve habitat for Tidestrom's lupine
- Develop interpretive signage to educate the public about dune ecology and discourage trampling of dune vegetation
- Avoid planting and control the spread of invasive, non-native plants
- Monitor the population of Tidestrom's lupine and adjust management programs to retain or increase the size of the existing population



- Determine whether black legless lizards remain along the Carmel shoreline. Implement habitat conservation and restoration measures if this species is found to exist. (LUP)

Water Quality, Drainage and Marine Resources

The City presently coordinates with the Carmel Area Wastewater District, the County of Monterey and other public agencies concerning the status and impact of future development on the water quality of the Carmel Bay Area of Special Biological Significance (ASBS). Since Carmel Bay is not under the direct planning purview of the City, this coordination role is the appropriate response for the City to this concern. Compared to the impact of growth in other areas, the impact of Carmel growth on future water supply and quality is minimal. However, the City has an important role to play in assuring that new development in the incorporated City limits does not contribute to water quality impacts from storm water or drainage discharges into the bay. (LUP)

Storm runoff onto Carmel Beach has been addressed in two fashions. First, the Association of Monterey Bay Area Governments, in preparation of the area wide 2008 water quality plan, reviewed the issue of runoff. It noted that high-density development has been causing sediment discharge in the area and encouraged local jurisdictions to adopt erosion and sediment control ordinances. Second, and more specifically, the adopted policy of the City is to clean the portions of the beach affected by runoff and sediment deposits after each winter. In this fashion, build-up of potential contaminants is prevented and the general quality of the sand is enhanced. Once each year, the beach is also re-contoured under the policies of the Shoreline Management Plan to reestablish the beach and bluff configuration, which is altered throughout the course of each year by visitor foot traffic. (LUP)

As a third management approach, the City is developing its NPDES Phase II Storm Water Plan (SWMP) and procedures manual that incorporates Best Management Practices to reduce the negative effects related to storm water runoff. The program outlines six minimum measures to proactively attack the problem of storm water runoff in a semi-urban area like Carmel. Minimum measures of the Storm Water Management Plan (SWMP) shall include:

- Public education and outreach
- Public participation and involvement
- Illicit discharge detection and elimination



- Pollution prevention and good housekeeping for municipal operations
- Construction site storm water runoff control
- Post-construction storm water management in new development and redevelopments. (LUP)

Best Management Practices (BMPs) include the City's routine street sweeping of roads, parking lots, and the commercial area. The education component informs residents of the consequences of using pesticides/fertilizers, and the benefits of cleaning up after pets. BMPs will address construction site "do's and don'ts." The City also has installed large storm water filter devices at the ends of Ocean Avenue and Fourth Avenue. Additional storm water filter systems are being installed at Sunset Center and at Eleventh Avenue/Torres Street near Mission Trail Nature Preserve. These systems collect runoff from the commercial area and the Ocean Avenue corridor removing debris and suspended materials before conveying runoff directly to the beach or into Mission Trail Nature Preserve and ultimately into Carmel Bay. Additionally, the Carmel Shoreline Management Plan includes a commitment to evaluate the feasibility of retrofitting storm water outfalls on the beach south of Ocean Avenue with filtration or treatment devices. (LUP)



Goals, Objectives and Policies

Hazards Prevention, Beach Maintenance and Shoreline Protection

G5-1 New development shall minimize risks to life and property, assure stability and structural integrity over the life of the development, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area. (LUP)

G5-2 Establish and implement a comprehensive shoreline management program for the beach, bluffs and dunes that mitigates degradation caused by public use and natural forces. (LUP)

O5-1 Minimize erosion of the bluffs. (LUP)

P5-1 Pursue scientific studies that document physical processes occurring at Carmel Beach (e.g. sediment transport, sand bar dynamics and influences from the Carmel Offshore Canyon). Seek funding for such studies from governmental agencies. (LUP)

P5-2 Obtain and maintain an accurate digitized map of the Carmel shoreline to develop the City's beach management and maintenance policies. Analyze historic beach trends using aerial photo analysis and other available tools. Update topographic information at least every 5 years and analyze shoreline changes to facilitate early identification of erosion hot spots, sand sediment losses/gains, migration of engineered revetments, and other long-term impacts. (LUP)

P5-3 Place a series of permanent surveyed benchmarks inland of the bluffs running the length of Carmel Beach. The surveyed benchmarks shall be described in relation to National Geodetic Vertical Datum (NGVD) and identified through permanent markers, benchmarks, survey position, written description, reference numbers, et cetera to allow measurements to be taken at the same location in order to compare information between years. (LUP)

P5-4 Prepare as-built plans showing the extent of all armoring in the SMP plan area in relation to the existing topography and other relevant features (including the top of bluff, base of bluff, sand-bluff interface, sandstone platforms, Scenic Road, Scenic Road pathway, and utilities in the Scenic Road rights-of-way, etc). The



as-built plans shall indicate vertical and horizontal reference distances from the surveyed benchmarks to the survey points on each structure for use in future monitoring efforts. (LUP)

- P5-5** Protect public access, Scenic Road, and the aesthetic character of the coast by maintaining existing seawalls and engineered revetments. When any existing seawalls or revetments need to be replaced or substantially reconstructed, review seawall and revetment design alternatives, as well as other beach management strategies and determine the best balance among objectives for access, aesthetics and protection of coastal resources (biological, geological, and recreational). Protect the natural character and features of the Del Mar and North Dunes by prohibiting the construction of any new shoreline protective structures unless required to protect existing structures in danger of erosion. For the beach and shoreline area, only consider the installation of new protective structures after careful review of alternatives and when required to protect existing structures in danger of erosion. Mitigate the impacts of shoreline protective structures on visual quality and beach dynamics using landscaping, sand management and prudent engineering. (LUP)
- P5-6** Construct new shoreline armoring in areas previously unprotected only when required to protect existing structures in danger of erosion and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply. Require any approved structures to include native landscaping (screening), be visually compatible with existing seawall designs, address drainage, incorporate visual mitigation, sand coverage for revetments, and golden granite facing for seawalls. (LUP)
- P5-7** Encourage the use of existing stairs, trails and pathways, and discourage off-trail “short cuts” on or over the bluff face. Install landscaping barriers at each “short cut” on the face of the bluffs and immediately restore damaged landscaping. (LUP)
- P5-8** Perform monitoring and maintenance of shoreline facilities and protective structures throughout the year including restoration of damaged vegetation, public facilities, infrastructure and access facilities. Restore sand levels annually and replace or repair damaged vegetation as needed. (LUP)



- P5-9** Evaluate the storm-water outfall system for purposes of reducing impacts to the beach environment. Consider options to modify and/or remove outfalls from the beach and replace or retrofit storm drains with filters or treatment devices to reduce impacts on the shoreline environment. (LUP)
- P5-10** Runoff from storm water outfalls shall be conveyed onto Carmel Beach in a non-erosive manner (i.e. runoff shall be discharged so as to minimize erosive forces.) (LUP)
- P5-11** Prohibit any construction of substantial or permanent structures on the beach or within Carmel Bay except where required to protect existing structures in danger from erosion. Require design review for any structure proposed and minimize conflict with the scenic and aesthetic character of the shoreline environs through such review. (LUP)
- P5-12** Ensure that the design of seawalls and engineered revetments are consistent with the aesthetic character of established structures. Continue to use golden granite (or better materials) for exposed vertical seawalls in locations where shoreline protection has been determined necessary. If vertical seawalls are not feasible, but engineered revetments may feasibly be installed, minimize the seaward encroachment of these structures and reduce the visual impact by burying stone revetments with beach sand and/or topsoil and native landscaping. (LUP)
- P5-13** Prohibit the placement of loose rock on the beach except where such rock is placed as part of a revetment allowed to protect an existing structure in danger from erosion. When any part of a rock revetment migrates from an engineered structure reposition it to maintain engineering stability or remove it from the beach. (LUP)
- P5-14** Protect the flat area/tidal zone of the beach for recreational use and, to the extent feasible, avoid shoreline protective structures that reduce the amount of beach area available for public recreation. (LUP)
- P5-15** Evaluate the potential to replace existing revetments with faced vertical seawalls or sea walls designed to mimic the natural bluff face, to reduce sandy beach area coverage and the need for sand bulldozing. All replacement structures must be found compatible with the areas' aesthetic qualities. Recognize that physiographic



- conditions may dictate a better alternative (e.g. when a specific area of the beach is more susceptible to reflected wave energy and consequent accelerated scour). (LUP)
- P5-16** Modification of existing shoreline structures shall adhere to the same standards for establishing need, obtaining permits, as well as landscaping, visual impacts, drainage and design as new seawall projects. (LUP)
- P5-17** Any project (including but not limited to repair, maintenance, expansion, modification, or replacement) involving the shoreline armoring structure that extends along the Carmel Beach bluff southeast from the mouth of Pescadero Creek shall require the façade to use materials that are complementary to shoreline armoring structures located along the Carmel Beach bluff south of 8th Avenue. (LUP)
- O5-2** Explore alternatives to maintain the sand elevation at the foot of Ocean Avenue to ensure public access and to cover with sand all exposed engineered revetments along the length of Carmel Beach. (LUP)
- P5-18** Each spring inspect the volume of sand at locations along the backshore and determine if it is appropriate and timely to reestablish the sand to a higher elevation. The use of heavy equipment is authorized for redistributing beach sand to rebuild the dunes and cover revetments. Minimize beach encroachment, impacts on public access and protect public safety during this process. (LUP)
- P5-19** As described in the Shoreline Management Plan, sand and bluff profiles shall be surveyed in 2003 and again in 2005 to establish a baseline. Thereafter, a set of sand profiles shall be taken at five-year intervals (beginning in 2010) to establish an ongoing record of shoreline trends (i.e., volume and natural rate of accretion and/or loss of beach sand) on Carmel's beaches and bluffs. For each set of profiles measurements shall be taken (1) at mid-Winter when sand is at its lowest, (2) at Spring, prior to sand redistribution activities, (3) at early Summer, immediately following sand redistribution and (4) in the early Fall, before sand begins its retreat offshore. (LUP)
- P5-20** After each five-year period of monitoring beach sand elevations (beginning in 2010 after data from 2003, 2005 and 2010 are available), review all available data and make preliminary



determinations regarding the effects of seawall structures and sand redistribution activities. If the results of the City's beach monitoring program indicate that the beach has been losing sand over time investigate options for beach nourishment using offshore deposits or other sources that match Carmel Beach sand to replenish the beach and protect its width. The program shall at a minimum: 1) identify potential sources of beach quality sand; 2) include testing and screening for determining the acceptable quality and quantity of beach material; 3) identify placement locations; 4) establish placement methods and any restrictions on work timing or methods. (LUP)

P5-21 Maintain Carmel Beach as a public recreational resource. If the results of the City's beach monitoring program indicate that the beach has been losing sand over time, develop, implement, and then further monitor and evaluate a beach nourishment program to maintain or increase the available volume of sand. (LUP)

P5-22 Maintain records of the volumes of sand moved and the volumes needed to cover each engineered revetment. When revetments fail or need to be substantially reconstructed or replaced, consider vertical seawalls as a preferred alternative unless monitoring data and/or engineering requirements favor an engineered revetment design. (LUP)

P5-23 Where unavoidable, minimize and mitigate all impacts to both marine and terrestrial resources when performing sand redistribution. (LUP)

P5-24 Prohibit motorized vehicles and motorized recreational equipment on Carmel Beach, sand dunes and other City owned parkland. This prohibition does not apply to city and contracted maintenance vehicles or public safety vehicles. (LUP)

O5-3 Perpetuate the mix of native dune and horticultural plants in an informal beach landscape. (LUP)

P5-25 Continue the use of Monterey Cypress as the predominant tree species on the beach bluff and North Dunes. The exact number of trees may vary over time, but whenever a tree dies or is lost during a storm, replacement trees should be planted in approximately the same location. Maintain a low-to-medium density of trees (40 to 60 trees) in the North Dunes. (LUP)



- P5-26** Encourage neighborhood cooperation and volunteers to assist City staff with the care of the landscape along the pathway. (LUP)
- P5-27** Maintain an attractive mix of plant material that favors native species and other, drought-tolerant, noninvasive species. (LUP)
- P5-28** Restore dune areas to improve habitat for Tidestrom's lupine and other native dune plants. (LUP)
- P5-29** Prohibit planting and control the spread of invasive non-native plants. (LUP)
- P5-30** Improve habitat values for the preservation of the California black legless lizard. (LUP)
- P5-31** Encourage the extension of the City's Pathway landscape style onto neighboring properties:
- Bring all City-owned property along this portion of Scenic Road into compliance with the approved Pathway plan.
 - Encourage private property owners to draw from the broad palette of plants used in the Pathway design.
 - Make presentations to the Scenic Road Property Owner's Association about this concept and share with the Association the plant list and a list of local suppliers.
 - Encourage the use of plants from this palette when reviewing projects on Scenic Road through the Design Review processes. (LUP)
- P5-32** Evaluate the Pathway landscape, including plant selection and associated design elements in consultation with a coastal landscape specialist; identify sites that require revitalization and implement restoration based on the Pathway Design Plan. Address the most severely impacted sites first. (LUP)
- O5-4** Maintain the vegetation and trees along the shoreline in a safe and healthy condition. (LUP)
- P5-33** Protect Monterey Cypress from structural damage caused by high winds. Develop a proactive trimming program to reduce length and weight of limbs and branches. (LUP)
- P5-34** Prune or repair trees immediately following limb failure to mitigate any safety hazards. At other times, trees may be pruned in accordance with City policy, keeping public safety, access and the tree's health as the primary goals. (LUP)
- P5-35** Pruning of vegetation will be done as needed for the health of the plants. This is a natural landscape and formal garden pruning is to be avoided. The pathway must be kept clear of overgrowth and



- periodic pruning is desired. However, neat straight edging is discouraged. Prevent shrubs from growing too high and blocking views of the ocean through the Cypress trees along the Beach Bluff Pathway. (LUP)
- O5-5** Continue implementation of the *Shoreline Emergency Action Response Plan* to minimize the dangers to public safety and facilities that may be caused by winter storms or other natural disasters (LUP).
- P5-36** Maintain the existing shoreline maintenance and emergency reserve account. Build fund balances over time, to the extent feasible, to handle future emergency repairs at the beach. (LUP)
- P5-37** Consider beach-related projects that address public safety and access as high-priority projects when preparing budgets. (LUP)
- O5-6** Keep the beach free of refuse. (LUP)
- P5-38** Provide sufficient trash containers at the beach. Regularly patrol the beach and Del Mar area to remove all litter and excess charcoal from the sand, bluffs and parking lot. (LUP)
- P5-39** Encourage volunteer programs for beach and bluff clean-up activities. (LUP)
- O5-7** Protect the fragile dunes and sensitive plants in the Del Mar Dunes and North Dunes against any significant disruption of habitat values. (LUP)
- P5-40** Provide signage prohibiting fires in the dunes area. Consider using doors on restroom stalls for posting beach rules and regulations. (LUP)
- P5-41** Continue Police Department enforcement of the no-fire regulation north of 10th Avenue and especially in the North Dunes and Del Mar Dunes areas. (LUP)
- P5-42** Restore, maintain and enhance the degraded habitat in the Del Mar Dunes area to enhance environmental resources and aesthetics. Protect sensitive habitat and special-status species through development and implementation of the Del Mar and North Dunes Master Plan. (LUP)



Urban Forests, Parks and Open Spaces

G5-3 Protect, conserve and enhance the unique natural beauty and irreplaceable natural resources of Carmel and its Sphere of Influence, including its biological resources, water resources, and scenic routes and corridors. (LUP)

O5-8 Protect, conserve and enhance designated open space, the urban Monterey pine forest, beach and shoreline, the sensitive habitats and the hillside areas, and acquire additional open space as deemed appropriate. (LUP)

P5-43 Maintain and preserve the shoreline in a manner that will ensure its availability for public use and enjoyment and preserve the natural condition in conformance with the adopted Carmel Shoreline Management Plan. (LUP)

P5-44 Maintain a Park Overlay District to ensure that development of private property adjacent to parks and open spaces is compatible with their continued enjoyment. (LUP)

P5-45 Maintain a Beach Overlay District for the purpose of providing a method of review and control for private property that is adjacent to public beach lands. Ensure that the development of private property is compatible with public enjoyment of the beach as a coastal resource. (LUP)

P5-46 Preserve and protect areas within the City's jurisdiction, which due to their outstanding aesthetic quality, historical value, wildlife habitats or scenic viewsheds, should be maintained in permanent open space to enhance the quality of life. Such acquired areas would be left in a natural state or restored for aesthetic and/or wildlife purposes. (LUP)

P5-47 Continue Carmel's tree preservation program and encourage the use of indigenous or native plants. (LUP)

P5-48 New development shall protect areas of unique scenic quality (e.g. Scenic Road, Junipero Ave, Torres & 3rd, etc.). Development in these areas shall be sited to protect public views to and along the coast, minimize impacts via landform alteration, and be visually compatible with the character of surrounding areas. (LUP)

G5-4 Preserve and enhance the City's legacy of an urbanized forest of predominantly Monterey pine, coast live oak and Monterey Cypress. (LUP)

O5-9 Maintain a Forest and Beach Commission and a Forest, Parks and Beach Department that have specific responsibility and jurisdiction for the health and well-being of the forest, parks and beach. (LUP)



- P5-49** Review periodically all existing tree-related ordinances and policies in the Forest Management Plan/LCP. Propose changes to bring them into alignment with new advances in urbanized forest management practice. (LUP)
- P5-50** Conduct the forest program in accordance with a coherent body of laws, goals, policies and guidelines. (LUP)
- P5-51** Coordinate all functions of the urban forest program through the City Forester. (LUP)
- P5-52** Commit resources necessary to support the forest, parks and beach programs. (LUP)
- O5-10** Maintain a Citywide map and database of trees and landscaped areas to support tree planting and maintenance programs. (LUP)
- P5-53** Complete a Citywide survey and database update every four years. Compile the data by size of tree and species in an electronic format. Also survey replacement trees required by permit conditions of approval. Report survey information and the status of replacement trees to the Forest and Beach Commission and Planning Commission at the conclusion of each yearly survey. Continue to monitor replacement trees for at least one survey cycle (i.e., 4 years). (LUP)
- P5-54** Require more open space on sites with significant forest resources based on site conditions as warranted to preserve the integrity of the urbanized forest. (LUP)
- O5-11** Maintain, restore and enhance the upper and lower tree canopy of Carmel's urbanized forest. (LUP)
- P5-55** Implement adopted tree density policies for private and public property as appropriate to each site taking into consideration neighborhood characteristics and site constraints. (LUP)
- P5-56** Establish and implement tree canopy policies for the commercial district. (LUP)
- P5-57** Maintain a list of tree species that could qualify as indigenous upper and lower canopy trees, for the purposes of meeting tree density and replacement policies. (LUP)



- P5-58** Maintain, restore and enhance a predominantly indigenous forest of native Monterey pines and coast live oaks. (LUP)
- P5-59** Avoid encroachment within the root protection zone of significant trees. Removal of significant live Monterey pine trees to facilitate residential development is prohibited unless necessary to provide a viable economic use or protect public health and safety. (LUP)
- P5-60** Review all projects involving an increase in lot coverage or tree removal and apply the adopted tree density policy as appropriate to each neighborhood and site conditions. Preserve upper and lower canopy trees classified as significant when planning and implementing residential and commercial development. (LUP)
- P5-61** Promote natural regeneration of the forest and retention of seedlings by maintaining natural ground surfaces. (LUP)
- P5-62** Use tree species and sizes well adapted for each planting site. (LUP)
- P5-63** Manage the tree-planting program to achieve an uneven-aged, healthy forest with particular emphasis on native Monterey pines and coast live oaks. (LUP)
- P5-64** New development shall be sited and designed to avoid or minimize significant adverse effects to the forest. Avoid projects that significantly increase building footprint to the detriment of trees. No grading, compaction of soils, construction of building walls or placement of impermeable surfaces within six feet of trees classified as significant shall be permitted. (LUP)
- O5-12** Implement policies, standards and procedures to regulate removal, pruning, and replacement of trees on private property. (LUP)
- P5-65** Permit the City Forester to act on requests for the removal and pruning of all trees growing on public and private property. (LUP)
- P5-66** Report sites that are non-conforming with standards for permeable surface lot coverage when applications for tree removal or pruning permits are filed. (LUP)
- P5-67** Permit the City Forester to apply special procedures for tree removal and pruning during emergencies. (LUP)



- P5-68** Record and monitor replacement trees to ensure their establishment and growth to maturity. (LUP)
- P5-69** Require ample and appropriate landscaping and tree plantings on all sites. Determine what is appropriate for each site by consulting the recommended tree density as appropriate to each neighborhood. Special emphasis must be paid to construction sites. Required replacement trees shall be of substantial size, caliper and height to produce an immediate visual impact and to reduce the incidence of unauthorized removal. (LUP)
- P5-70** Require a documented site assessment, or meeting between a planner, City Forester, and the property owner/developer, on each proposed construction site to discuss tree preservation and planting. Establish tree protection zones and suitable locations for development through this process. This shall be done before plans have been drawn. (LUP)
- P5-71** Evaluate, protect and preserve all trees (and their root zones) on sites prior to, during, and after construction. Ensure that all building sites abide by appropriate tree protection and preservation standards and guidelines provided in the Forest Management Plan. (LUP)
- O5-13** Perform all tree work and landscaping within the City in accordance with City codes and policies and uniform planting practices that reflect the best current knowledge of tree and plant care. (LUP)
- P5-72** Maintain close cooperation among all public agencies, tree services, arborists, landscape architects, gardeners and utility companies affecting the urban forest. (LUP)
- P5-73** Require that all City departments, utility companies, tree service companies, arborists, landscapers and gardeners adhere to the adopted Tree Maintenance Standards policies and guidelines. (LUP)
- P5-74** Provide a comprehensive training program for City staff and encourage employees to become Certified Arborists or Certified Tree Workers under the standards of the International Society of Arboriculture. (LUP)



P5-75 Negotiate with the Public Utilities Commission and utility companies to adopt minimal line clearance standards to give special attention to Carmel's urbanized forest. (LUP)

O5-14 Maintain a healthy forest.

P5-76 Work in concert with other area foresters and arborists, the Monterey Pine Forest Ecology Cooperative, the Pitch Canker Task Force, Oak Mortality Task Force and university researchers to address acute concerns to the health of the forest. (LUP)

P5-77 Monitor tree pest and disease problems and take appropriate measures to minimize their impact. (LUP)

P5-78 Foster healthy and disease resistant trees and avoid widespread application of pesticides. (LUP)

P5-79 Investigate ways to discourage large trucks from using streets with low tree limbs. (LUP)

P5-80 Plant native Monterey pine seedlings of different genotypes to maximize resistance to diseases and make these seedlings available to the public. (LUP)

P5-81 Minimize risk to trees by regulating the use of heavy equipment. (LUP)

P5-82 Properly dispose of diseased trees and recycle tree waste. (LUP)

P5-83 Avoid disturbance and fragmentation of large intact stands of Monterey pine. (LUP)

P5-84 Minimize the spread of pitch canker through appropriate methods (sterilize equipment, appropriate disposal of cuttings, etc.). (LUP)

P5-85 Conduct most City pruning activities on Monterey Pine and other conifers during winter months when insect populations are less active and when bird, raptor and mammal populations are not nesting. (LUP)

O5-15 Educate and involve the public in tree issues. (LUP)

P5-86 Undertake an active program of community outreach and education. (LUP)



- P5-87** Publish timely tree care articles in local news media. (LUP)
- P5-88** Encourage monetary and other contributions in support of the urbanized forest program. (LUP)
- P5-89** Provide the City Council, Planning Commission and Forest and Beach Commission with information on an annual basis from the ongoing tree survey regarding projected changes in the composition of the forest and recommendations for policy amendments. (LUP)
- P5-90** Involve citizen groups in forestry programs so that forest-related subjects are seen as community issues that require broad based involvement and support. (LUP)

G5-5 Maintain and enhance the informality of streetscapes. (LUP)

- O5-16** Remove or reduce unnecessary or excessive hardscape and other nonconforming encroachments on City parklands and within street rights-of-way to provide for and promote planting of trees and native vegetation. (LUP)
- P5-91** Require at the issuance of a building permit, the abatement or retroactive approval of any nonconforming encroachments in the public rights-of-way. (LUP)
- P5-92** Look for opportunities to reduce or eliminate hardscape areas Citywide on public and private lands. Identify hardscape in the public rights-of-way and on-site that does not meet current policies or codes during preliminary site assessments and/or design review for all projects in the R-1 District. Require that project landscaping plans include the public rights-of-way. (LUP)
- P5-93** Continue the practice of painting only the vertical portion of the curb on the west side of Scenic Road for traffic control. (LUP)
- O5-17** Use mini-parks and islands for planting trees, with an emphasis on native Monterey Pines, oaks, and other native vegetation. (LUP)
- P5-94** Identify opportunities for new trees, removal of invasive plants and landscaping to enhance streetscapes during planning for street reconstruction projects. (LUP)



P5-95 Recognize the City's narrow street paving, roadside vegetation and overarching canopy as important elements contributing to the streetscape, pedestrian circulation, traffic calming, community aesthetics and environmental enhancement. Identify character-defining features of roadways and retain and enhance these features when planning and implementing street improvements, repairs and reconstructions. (LUP)

O5-18 Incorporate adequate landscaping and trees of the urbanized forest in all public construction projects. (LUP)

P5-96 The City staff member responsible for any public project shall involve the Forest, Parks and Beach Department through the planning and implementation stages of the project. (LUP)

P5-97 Include funding for the design and installation of landscaping as part of each public project. (LUP)

G5-6 Preserve and acquire open space and parks. (LUP)

O5-19 Maximize the amount of open space in the City and sphere of influence by establishing development fees and/or other methods to fund open space acquisition. (LUP)

P5-98 Resist the transfer of open space to other uses. (LUP)

P5-99 Encourage rezoning to open space. (LUP)

P5-100 Actively pursue the preservation of existing open space within the City's sphere of influence. (LUP)

O5-20 Restore and maintain open space to its natural state. (LUP)

P5-101 Establish and implement a procedure for removal of invasive vegetation. (LUP)

P5-102 Minimize removal of native vegetation. (LUP)

P5-103 Identify and protect environmentally sensitive habitat areas against any significant disruption of habitat values. Only uses dependant upon those resources shall be allowed. For private lots of record within ESHA, establish a transfer of development rights program using credits of water, floor area, density or some other



development parameter to relocate development to less sensitive areas. (LUP)

P5-104 Preserve and protect wetlands. (LUP)

O5-21 Optimize public use of City parks. (LUP)

P5-105 Implement the recommendations of all existing Master Plans considering prioritized needs and available funding:

- a. Mission Trail Nature Preserve Master Plan
- b. Shoreline Management Plan
- c. Forest Hill Park Master Plan

P5-106 Develop and implement specific plans, master plans or other programs in other areas where needed. (LUP)

P5-107 Provide for public access and passive enjoyment of City parks and open space. (LUP)

P5-108 Provide and maintain informal trails if there is public demand.

G5-7 Conserve water and minimize storm runoff (LUP)

O5-22 Maximize retention of surface water on each site through site design and use of best management practices. (LUP)

P5-109 Where feasible, direct street runoff to open space areas on public or private property for percolation into the soil. (LUP)

P5-110 New construction plans should include design features to enhance surface water percolation. Where practical, runoff from the roof, driveway and other impervious surfaces shall be collected and directed into pervious areas on the site (landscaped areas) for infiltration in a non-erosive manner, prior to being conveyed off-site. (LUP)

P5-111 Encourage homeowners to absorb surface water on their own property. Implement development standards that minimize runoff and the amount of area paved with impervious surfaces. Encourage homeowners and commercial property owners to install cisterns for landscaping to decrease water use and to reduce runoff. (LUP)



- P5-112** Implement the public rights-of-way design guidelines for the commercial district that call for sand-set pavers for all sidewalks and patios and includes collection of roof drainage to irrigate landscaping and street trees. (LUP)
- O5-23** Landscape with drought tolerant plants, shrubs and trees of the urbanized forest. (LUP)
- P5-113** Provide to the public an established list of indigenous and non-indigenous drought tolerant plants. (LUP)
- P5-114** Require approval of landscape plans for drought-tolerance and trees by the Forest, Parks and Beach Department on new construction at Final Design Review or before issuing a building permit. Include specifications for location, species, size and planting guidelines for all required replacement trees in this review. (LUP)
- O5-24** Minimize the use of potable water for landscape irrigation. (LUP)
- P5-115** Use low output sprinkler heads and/or drip irrigation for landscape irrigation systems. (LUP)
- P5-116** Use on-site water retention devices to capture precipitation or surface runoff for landscape maintenance purposes. (LUP)

Mission Trail Nature Preserve

- G5-8** Preserve the forested tranquil atmosphere of Mission Trail Nature Preserve. (LUP)
- O5-25** Preserve and enhance the vegetative diversity in Mission Trail Nature Preserve consisting of Monterey pine forest, central coast willow riparian forest, wet meadow, coast live oak woodland, redwood, box elder, cottonwood, coastal terrace prairie and horticultural plantings. (LUP)
- P5-117** Continue the annual Monterey pine seedling planting during the winter of each year (utilizing the seed collecting guidelines of the Genetic Resources Conservation Program of the University of California, Davis in order to maintain appropriate genetic diversity). Enhance efforts to replant and maintain native tree species similar to nearby native riparian vegetation. (LUP)



- P5-118** Avoid removal or pruning of native riparian vegetation except for drainage channel and road/trail clearance and/or for the purpose of new native indigenous tree/shrub establishment. (LUP)
- O5-26** Enhance the coastal terrace prairie habitat on the west and south facing slopes in the Martin Road parcel and between the Outlet Meadow and Ladera Drive. (LUP)
- P5-119** Remove by hand nonnative shrubs and their roots invading these areas during late spring when soils are moist and before seed/seed pods become viable. (LUP)
- P5-120** Avoid further erosion and loss of native coastal and terrace vegetation. (LUP)
- O5-27** Reduce the introduction and population of invasive horticultural species in the Preserve. (LUP)
- P5-121** Provide residents of adjacent properties with a list of plants that are compatible with the native vegetation of the Preserve. Encourage use of this list as a guide for planting private landscapes. Additionally, provide a list of invasive plants to avoid. (LUP)
- P5-122** Organize volunteer work groups to remove non-native plants from the Preserve. The California Department of Forestry and Fire Protection crews from Gabilan Camp could be used to assist in this effort. (LUP)
- G5-9** **Protect, maintain and enhance the rare coastal habitats and associated plants and animals within Mission Trail Nature Preserve. (LUP)**
- O5-28** Prepare annual maintenance plans for habitats within the Preserve. Encourage native vegetation to re-establish on sites previously mowed, cut, or invaded by exotic species. (LUP)
- P5-123** Allow willows to grow in the riparian corridor and the wet meadow. (LUP)
- P5-124** Consider removal of both intentionally introduced plants and invasives by instituting an annual program through joint efforts of contract workers and volunteers. (LUP)



- P5-125** Research the most appropriate time for mowing grasses to encourage the growth of native plants and discourage exotics and schedule accordingly. (LUP)
- O5-29** Monitor and protect the Hickman's onion population found in the Preserve. (LUP)
- P5-126** Consider retaining a qualified volunteer botanist to monitor the population of Hickman's onion to determine if current management practices and public use of the coastal terrace prairie are affecting the viability of the population. (LUP)
- P5-127** Limit access in the coastal terrace prairie during winter and spring months when soil disturbance could affect the species. (LUP)
- O5-30** Maintain and enhance habitat for Monterey Dusky-Footed Woodrat (a special-status wildlife species), in accordance with recommendations of a qualified wildlife biologist. (LUP)
- P5-128** Consider retaining a volunteer biologist to monitor the rat's population and develop a management plan to help ensure its survival. (LUP)
- P5-129** Minimize disturbance within 200 feet of any Woodrat nests. (LUP)
- P5-130** Prohibit cleaning of City maintenance equipment in the Preserve. (LUP)
- G5-10** **To preserve the natural drainage of Mission Trail Nature Preserve and enhance wetlands. (LUP)**
- O5-31** Maintain natural drainage patterns except where erosion or human safety problems may be created. Maintain the existing creek bed and preclude it from becoming debris clogged. Encourage/allow the channelized ditch to revert to a more natural channel in order to enhance the Preserve's wetlands (riparian forest, wet meadow) and natural character. (LUP)
- P5-131** Remove fallen trees and limbs from the stream channels as needed. Place natural boulders and creek cobbles to prevent erosion only in situations where private property or public safety is at risk. (LUP)
- P5-132** Repair stream bank deterioration as it occurs, and remove inert debris and new growth to the extent that they prohibit water flow within the established channel. Projects of this nature shall be



- reviewed by the Forest and Beach Commission, similar to its review of street projects. (LUP)
- P5-133** Maintain a box culvert inlet adjacent to Rio Road to prevent flooding. (LUP)
- P5-134** Consult with appropriate agencies regarding wetland management. (LUP)
- P5-135** Preclude manmade objects from inhibiting drainage along the road in Mission Trail Nature Preserve. (LUP)
- P5-136** Maintain the shoulders and cross flows on the Preserve bed to insure surface water can easily enter the creek. (LUP)
- P5-137** Clean and grade road shoulders and maintain culverts at least twice yearly, to insure continuous drainage. The Forest and Beach Department will trim vegetation to the extent necessary to allow access by the City maintenance equipment and fire apparatus. (LUP)
- O5-32** Provide reasonable low-impact uses of the Mission Trail Nature Preserve for the enjoyment of its natural surroundings and plant and wildlife inhabitants. (LUP)
- P5-138** Maintain and make available an up-to-date printed brochure that offers Preserve users helpful information. The brochure would also offer appropriate explanations for Preserve use restrictions. (LUP)
- P5-139** Provide maximum public access to and within Mission Trail Nature Preserve that is easy to maintain and protects environmental resources. (LUP)
- P5-140** Formalize a trail through Martin Meadows. (LUP)
- P5-141** If retained by the City, preserve the Outlands property and grounds at Mission Trail Nature Preserve consistent with its status as a nationally registered historical resource. (LUP)
- P5-142** If retained by the City, utilize the Outlands property at Mission Trail Nature Preserve in a manner beneficial to the residents of Carmel-by-the-Sea while minimizing its expense to the City. (LUP)



- P5-143** If retained by the City, support uses at the Outlands property that are compatible with its location in Mission Trail Nature Preserve and adjacent to the Rowntree Native Plant Garden and Hatton Road neighborhood. (LUP)
- O5-33** Maintain the Rowntree Native Plant Garden within Mission Trail Nature Preserve as an area where the general public can view and study native California plants and trees. The goal is that the knowledge gained will lead to an expanded use of California native plants in private landscapes. (LUP)
- P5-144** Create and maintain a demonstration garden for native flowers in Mission Trail Nature Preserve. (LUP)
- P5-145** Label native plants and areas in the garden at Mission Trail Nature Preserve with identifying and explanatory information. (LUP)
- O5-34** Consider establishing a Volunteer Committee to assist the City Forester and staff in responsibility for the garden at Mission Trail Nature Preserve. (LUP)
- P5-146** Maintain communication between Forest and Beach Commission and Monterey Bay Chapter of the California Native Plant Society. (LUP)
- P5-147** Recruit and train volunteers to plant, weed, water and care for the garden in Mission Trail Nature Preserve under the direction of the Forest, Parks and Beach Department staff. (LUP)
- P5-148** Schedule and advertise volunteer workdays as needed to maintain the garden in Mission Trail Nature Preserve. (LUP)
- G5-11 Maintain Mission Trail Nature Preserve using great care to avoid degradation of resources. (LUP)**
- O5-35** Implement the Mission Trail Nature Preserve Master Plan maintenance provisions. (LUP)
- P5-149** Repair stream bank deterioration as it occurs, and remove inert debris and new growth to the extent that they prohibit water flow within the established channel. (Annually: September - October.) (LUP)
- P5-150** Clean and grade road shoulders and maintain culverts to ensure continuous drainage. Trim vegetation to the extent necessary to



allow access of equipment (Annually: September - October.)
(LUP)

P5-151 Remove fallen limbs and trees from stream channels (As needed.)
(LUP)

P5-152 Place rip-rap to prevent erosion only in situations where private property or public safety is at risk (as needed.) (LUP)

P5-153 Mow meadow grasses to reduce the risk of fire (June.) if consistent with special status plant management needs. (LUP)

P5-154 Maintain the Serra Trail to allow access of emergency vehicles (Semiannually.) (LUP)

P5-155 Remove dead/hazardous trees only as needed. Leave dead trunks in place when not hazardous to provide habitat for woodpeckers and other fauna. (LUP)

P5-156 Conduct trail maintenance and clearance (June - August.) (LUP)

Environmentally Sensitive Habitat Areas

G5-12 Identify, protect and manage Environmentally Sensitive Habitat Areas (ESHAs) to ensure their long-term integrity and the biological productivity of these habitats. (LUP)

O5-36 Monitor, study and develop effective management programs for the City's parks and ESHAs. Endeavor to reduce conflicts between environmental protection and use of public and private property within ESHAs. (LUP)

P5-157 Support public ownership of sensitive habitats and encourage public-private partnerships for the long-term management of habitats. (LUP)

P5-158 Regulate the removal or alteration of riparian vegetation within identified ESHAs to protect riparian habitats. (LUP)

P5-159 Maintain and enhance the resource value of environmentally sensitive habitat areas in consultation with a qualified biologist and in coordination with the California Department of Fish and Game. Remove any non-native, invasive vegetation from sensitive habitats. (LUP)



- P5-160** Implement a Transfer of Development Rights program to allow owners of single-family residential lots containing ESHAs to transfer water credits, density, floor area or some other form of development credit to other property within the City as an alternative to the development of their lots. If this proves infeasible, allow such lots to be developed with one single-family house limited in size to not more than 50% of the standard floor area for the lot, sited and designed to avoid or, if avoidance is not possible, minimize disturbance of the ESHA to the greatest degree possible. Also consider purchase of private ESHA properties with assistance from land trust or similar organizations. (LUP)
- P5-161** Avoid disturbance or degradation of resources when maintenance vehicles and equipment enter sensitive habitat areas. (LUP)
- O5-37** Reduce the introduction and spread of invasive horticultural species into and within identified ESHAs. Encourage a volunteer program of citizens and property owners to participate in maintenance and enhancement of sensitive habitats. Develop a Stewardship Program based on the premise that resource management is a cooperative effort between the City and its citizens. (LUP)
- P5-162** Establish a 100-foot buffer measured from the edge of the riparian habitat where fertilizers, pesticides, herbicides, or other chemicals are prohibited. (LUP)
- P5-163** Prepare and distribute an information pamphlet about the Stewardship Program to educate landowners on the importance of maintaining and enhancing ESHAs and other important habitats that cross over park boundaries and into residential neighborhoods. (LUP)
- P5-164** Compile and maintain a mailing list of all property owners adjacent to each ESHA. Send periodic mailings or information sheets to property owners concerning various topics, such as maintenance of fire buffers, use of native plants in landscaping to enhance habitats, not feeding feral animals, and removal techniques for common invasive species (e.g., French broom, Cape ivy, etc.). (LUP)
- P5-165** The information could be distributed by volunteer members to achieve a more personal relationship, thereby, stimulating the Stewardship Program. (LUP)



- O5-38** Manage environmentally sensitive habitats in Mission Trail Nature Preserve to maintain and enhance their natural integrity. Preserve and protect Mission Trail Nature Preserve native plant, wild animal and bird populations. (LUP)
- P5-166** Avoid future erosion and loss of native coastal terrace prairie vegetation in the Martin Road Parcel. Improve the foot trail to limit trampling of native vegetation. Install interpretive signage to educate the public on the ecology of the coastal terrace prairie and emphasize the importance of remaining on the trails. (LUP)
- P5-167** Limit vehicle use in the flat portion of the Martin Road Parcel where the claypan soil readily saturates to the surface and is susceptible to compaction and damage. (LUP)
- P5-168** Establish a 30-foot vegetation buffer along the perimeter of Mission Trail Nature Preserve. Encourage residents along the Preserve perimeter to remove vegetation to the minimum extent necessary to reduce fire hazards. Maintain vegetation cover along the slopes to reduce erosion. (LUP)
- O5-39** Manage Pescadero Canyon ESHAs by controlling runoff, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of the creek channel. (LUP)
- P5-169** Rezone public-owned parcels in Pescadero Canyon to the Park Zone (P-1). (LUP)
- P5-170** Implement measures to preclude development in Pescadero Canyon. If these prove feasible, allow limited development, consistent with California Coastal Act Section 30240 (a) and (b), taking into consideration as far as possible underlying zoning, on privately owned parcels within the Pescadero Canyon ESHAs. If development is allowed it shall be setback fifty feet (50') or more (measured from the water line of the creek) based on site-specific biological conditions and soil conditions. Mitigate the impacts of development by controlling drainage, erosion, construction activity, landscaping and by requiring a long-term maintenance plan that monitors and protects environmental resources. (See also Policy P9-301). (LUP)
- P5-171** Cooperate in regional efforts to manage the entire Pescadero watershed for habitat value and fire safety. (LUP)



- P5-172** Develop a long-term plan to control surface drainage into the canyon from streets and adjacent parcels. Direct drainage into either the storm water system or to the canyon bottom with erosion-control devices to prevent damage to the riparian and wetland zones. (LUP)
- O5-40** Ensure that long-term management activities maintain the natural dune ecology of Carmel Beach in a manner consistent with public safety. Protect areas of the beach from the loss of habitat, where special status plant species are growing. (LUP)
- P5-173** Retain a qualified botanist to monitor the population of Tidestrom's lupine and other special status species on the North Dunes of Carmel Beach. The population should be assessed annually (or based upon a schedule agreed upon by the Department of Fish and Game, Coastal Commission and U.S. Fish and Wildlife Service) to determine if the population is stable and if measures to protect the population should be instituted. If the population appears heavily affected by public use, the City should consider fencing or placing barriers around the lupine habitat on the beach. (LUP)
- P5-174** Prevent further planting and spread of invasive horticultural species within the dunes at Carmel Beach. (LUP)
- P5-175** Remove any non-native invasive vegetation from special status habitat to eliminate competition and implement a dune restoration plan. (LUP)
- P5-176** Implement a Dune Restoration Plan. (LUP)
- P5-177** Minimize spread of non-native plants. (LUP)
- P5-178** Conduct black legless lizard surveys and manage appropriately. (LUP)
- G5-13** **Develop, preserve and enhance areas of scenic interest and determine methods to protect key scenic corridors and routes. (LUP)**
- O5-41** Encourage increased use of open space areas for such uses as pedestrian paths and scenic viewpoints that would provide for public enjoyment of these areas. (LUP)
- P5-179** Enhance the natural resources at Forest Hill Park. Plant Monterey pine seedlings using local genetic stock, according to guidelines



provided by the Genetic Resources Conservation Program of the University of California, Davis. Avoid further bank erosion and gullyng at Forest Hill Park by implementing structural measures and soil bioengineering techniques to stabilize the drainage banks. (LUP)

P5-180 Support the State and County designated Scenic Highways and related policies, wherever it appears in the best interest of Carmel to do so. (LUP)

P5-181 Preserve the significant coastal view from the intersection of Torres Street and Third Avenue and across Vista Lobos, the City owned land near this intersection for public benefit and enjoyment. (LUP)

Water Quality, Drainage and Marine Resources

O5-42 Recognize the natural resources and scenic quality of Carmel as a coastal community and allow uses in the community that are consistent with local needs and the California Coastal Act. (LUP)

P5-182 Continue to ensure that development, whether commercial or residential, does not diminish the village character by excessively blocking important public views, private views or disturbing natural topography, significant trees, or native growth. (LUP)

P5-183 Promote the placement of utilities underground where feasible and with minimum detriment to the root system of trees. (LUP)

P5-184 Maintain, enhance, and where feasible, restore marine resources. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes (Section 30230, California Coastal Act). (LUP)

P5-185 Maintain and restore, where feasible, the biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health, through, among other means, minimizing adverse effects of waste water discharges



and entrainment; controlling runoff; preventing depletion of ground water supplies and substantial interference with surface water flow; encouraging waste water reclamation; maintaining natural vegetation buffer areas that protect riparian habitats; and, minimizing alteration of natural streams (Section 30231, California Coastal Act). (LUP)

O5-43 Protect and enhance the water quality and biological productivity of local creeks, wetlands, and Carmel Bay through the prevention of point- and non-point-source water pollution. (LUP)

P5-186 Develop, Implement, Monitor, and Modify (as necessary) a City-wide Storm Water Management Plan (SWMP) outlining specific tasks, Best Management Practices (BMP's), and responsibilities necessary to implement the City's National Pollution Discharge and Elimination System permit and to protect water quality. Minimum measures of the Storm Water Management Plan shall include:

1. Public education and outreach
2. Public participation and involvement
3. Illicit discharge detection and elimination
4. Pollution prevention and good housekeeping for municipal operations
5. Construction site storm water runoff control
6. Post-construction storm water management in new development and redevelopments.

Each measure shall identify source control and treatment BMP's designed to control, prevent, reduce or remove typical runoff pollutants. Typical runoff pollutants describe constituents commonly present in runoff associated with precipitation and irrigation. Typical runoff pollutants include, but are not limited to: paints, varnishes, and solvents; hydrocarbons and metals; non-hazardous solid wastes and yard wastes; sediment from construction activities (including silts, clays, slurries, concrete rinsates, etc.); ongoing sedimentation due to changes in land cover/land use; nutrients, pesticides, herbicides, and fertilizers



(e.g., from landscape maintenance); hazardous substances and wastes; sewage, fecal coliforms, animal wastes, and pathogens; dissolved and particulate metals; and other sediments and floatables. The City shall be responsible for evaluating the efficacy of its SWMP and updating it on a regular ongoing basis (i.e., at least once every 5 years or as directed by NPDES Phase II). The SWMP shall be submitted to the California Coastal Commission for its incorporation as an element of the LCP upon completion. Any modification to the SWUP shall be submitted in a timely manner as an LCP amendment. (LUP)

P5-187 Coordinate with other agencies in the watershed area to develop public education programs on urban runoff issues and the appropriate roles of individuals, businesses, and government in the implementation of “Best Management Practices” for pollution prevention and control. (LUP)

P5-188 Cooperate with regional and state agencies in the detection and elimination of illegal discharges of pollutants into Carmel Bay. Promote the proper disposal of pollutants to the sanitary sewer or hazardous waste facilities rather than the storm drainage system. Establish appropriate inspection criteria for new development and respond to complaints of illegal discharges. (LUP)

P5-189 Adopt regulations for the prevention of illegal discharges to streams, wetlands, and the storm drainage system, and for the proper management of urban runoff. (LUP)

O5-44 Establish watershed protection policies to guide all new development and redevelopment proposals during the planning, project review, and permitting processes. (LUP)

P5-190 Avoid, where feasible, construction on areas particularly susceptible to erosion and sediment loss (e.g., steep slopes). Establish development guidance that identifies these areas and protects them from erosion and sediment loss. Prohibit grading in areas with slopes of 30 percent or greater from October through April except in response to emergencies. (LUP)

P5-191 Retain creek channels in their natural state, and prevent undue erosion of creek banks. Development near watercourses will be regulated to reduce erosion and pollution and to preserve open natural areas. (LUP)



- P5-192** Preserve or restore areas that provide water quality benefits and/or are necessary to maintain riparian and aquatic biota. (LUP)
- P5-193** Promote site development that protects natural topography, drainage systems, and surface waters. (LUP)
- P5-194** Integrate storm water quality protection into construction and post-construction activities at all development sites. Evaluate the ability of each site to detain storm water runoff and require incorporation of detention facilities or other controls as appropriate. As part of site approval or as a condition on a tentative map, require permanent storm water pollution control measures or systems and an ongoing maintenance program, as necessary. (LUP)
- O5-45** Reduce dependence on drainage structures and pipes for runoff. (LUP)
- P5-195** Provide development guidelines and permit conditions that: limit impervious surfaces and the connection of multiple impervious surfaces; implement simple infiltration techniques throughout drainage areas to efficiently manage storm water; infiltrate runoff into the soil, retain runoff for slower release and convey runoff slowly through vegetation. (LUP)
- P5-196** New roads, bridges, culverts, and outfalls shall not cause or contribute to stream bank, hillside, or bluff erosion or creek or wetland siltation and shall include BMP's to minimize impacts to water quality including construction phase erosion control and polluted runoff control plans, and soil stabilization practices. Where space is available, dispersal of sheet flow from roads into vegetated areas or other on-site infiltration practices shall be incorporated into road and bridge design. (LUP)
- P5-197** New development shall protect the absorption, purification, and retention functions of natural systems that exist on the site. Where feasible, drainage plans shall be designed to complement and utilize existing drainage patterns and systems, conveying drainage from the developed area of the site in a non-erosive manner. Disturbed or degraded natural drainage systems should be restored, where feasible. (LUP)
- P5-198** Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control



projects where no other method of protecting existing structures in the floodplain is feasible and where such protection is necessary for public safety or to protect existing structures in the floodplain or (3) developments where the primary function is the improvement of fish and wildlife habitat. (LUP)

O5-46 Use alternative building designs, which improve filtration of water through landscaping and natural areas. Ensure that all development includes appropriate water quality Best Management Practices (BMPs). (LUP)

P5-199 Consistent with section 30231 of the Coastal Act, development shall not result in the degradation of coastal waters caused by the introduction of pollutants, or by changes to the landscape that adversely impact the quality, quantity and flow dynamics of coastal waters. Runoff shall not be discharged in a manner that adversely impacts the biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and protect human health. (LUP)

P5-200 Set criteria and establish appropriate design guidelines for structural and nonstructural BMPs; adopt a manual of BMPs to guide project design and engineering. BMPs shall mitigate both construction and long-term water quality impacts. Specify type, location, size, implementation and maintenance schedules as part of the City's SWMP; Maintain BMPs that prevent storm water pollution and address trash disposal, outside storage of materials, vehicle-washing etc. (LUP)

P5-201 BMPs shall be incorporated into the project design in the following progression:

- **Site Design BMPs:** Any project design feature that reduces the generation of pollutants or reduces the alteration of the natural drainage features, such as minimizing impervious surfaces or minimizing grading;
- **Source Control BMPs:** Practices that prevent release of pollutants into areas where they may be carried by runoff, such as covering work areas and trash receptacles, practicing good housekeeping, and minimizing use of irrigation and garden chemicals;



- **Treatment Control BMPs:** Any system designed to remove pollutants from runoff including the use of gravity settling, filtration, biological uptake, media adsorption or any other physical, biological or chemical process.

Site design and source control BMPs shall be included in all new developments. Where the development poses a threat to water quality due to its size, type of land use or proximity to coastal waters (or proximity to a creek, channel or storm drain system that leads to coastal waters) and the combination of site design and source control BMPs is not sufficient to protect water quality as required by **P5-199**, treatment control BMPs shall be implemented. (LUP)

P5-202 The City shall include a procedure in the Implementation Plan for reviewing all development for impacts to water quality. This procedure shall include:

- A checklist or equivalent tool to help in the review of Coastal Development Permits for potential impacts to water quality. Such a checklist shall, at a minimum, include questions about the management practices proposed to reduce the impact of polluted runoff, area of impervious surface to be created, uses of the development that might generate polluted runoff and proximity of the development to coastal waters, drainage ways that lead to coastal waters or sensitive coastal resources.
- Criteria for determining whether a treatment control BMP will be required (criteria shall include, but are not limited to type of land use, size and type of development, proximity to coastal waters, drainage ways that lead to coastal waters, sensitive coastal resources, etc.).

This review procedure shall identify the potential water quality impacts from the development, and prescribe appropriate site design, source control or treatment control BMPs necessary to address those impacts. (LUP)

P5-203 The Implementation Plan shall include a manual of BMPs to guide project design and engineering for development within the coastal zone. The city shall either develop the manual or identify an existing BMP manual (e.g., the latest version of the California Storm water BMP Handbook). BMPs shall be selected to mitigate



both construction and post-construction water quality impacts. The manual shall describe specific BMPs, including type, location, size, implementation and maintenance schedules. The manual shall describe the appropriate use of those BMPs to remove specific classes of pollutants. The manual will also provide guidance on how to size treatment control BMPs to meet the Numeric Design Standard. (LUP)

- P5-204** Implement municipal maintenance programs which ensure: public projects that don't require a permit shall also be subject to water quality measures, integrate appropriate BMPs in redevelopment projects including storm drain upgrades; use integrated pest management and plan health care strategies as an alternative to applying chemical pesticides and herbicides; provide bags and trashcans to encourage pet waste pick-up in parks, the beach and residential areas. (LUP)
- P5-205** All structural BMP's shall be inspected, cleaned, and repaired as necessary to ensure proper functioning of the BMP's. (LUP)
- P5-206** Where post-construction treatment controls are required, the BMPs (or suites of BMPs) shall be designed to infiltrate and/or treat the amount of storm water runoff produced by all storms up to and including the 85th percentile, 24-hour storm event for volume-based BMPs, and/or the 85th percentile, 1-hour storm event, with an appropriate safety factor (i.e., 2 or greater), for flow-based BMPs. The term "treatment" includes physical, biological and chemical processes such as filtration, the use of bio-swales, detention and retention ponds and adsorption media. The actual type of treatment should be suited to the pollutants generated by the development as indicated in the BMP Manual. (LUP)
- P5-207** Under limited circumstances, where the implementation of a treatment control BMP would typically be required to reduce the impacts of a development on water quality, the City may determine that requiring this structural BMP to be sized to the Numeric Design Standard (**P5-206**) is not feasible. In these cases, the applicant may propose an alternative suite of site design, source control and treatment control BMPs which provide, at a minimum, equivalent protection to that provided by a standard suite of site design, source control and treatment control BMPs meeting the Numeric Design Standard.



The Implementation Plan shall include a procedure to determine when it would not be feasible to apply the required treatment control BMPs designed to meet the Numeric Design Standard and for evaluating whether alternative measures provide equivalent water quality protection. Coastal Development Permit applications that use this alternative shall provide complete explanation of how the proposed project will provide equivalent protection for water quality. (LUP)

P5-208 New development shall minimize the development footprint and directly connected impervious surfaces, as well as the creation of and increases in impervious surfaces. (LUP)

P5-209 New development shall be sited and designed on the most suitable portion of the site while ensuring protection and preservation of natural and sensitive site resources by providing for the following:

- Protecting areas that provide important water quality benefits, areas necessary to maintain riparian and aquatic biota and/or that are susceptible to erosion and sediment loss;
- Analyzing the natural resources and hazardous constraints of planning areas and individual development site to determine locations most suitable for development;
- Promoting clustering of development on the most suitable portions of a site taking into account geologic constraints, sensitive resources, and natural drainage features;
- Preserving and protecting riparian corridors, wetlands, and buffer zones;
- Minimizing disturbance of natural areas, including significant trees, native vegetation, and root structures;
- Using natural drainage as a design element, maximizing the preservation of natural contours and native vegetation;
- Limiting land disturbance activities such as clearing and grading, limiting cut and fill to reduce erosion and sediment loss, and avoiding steep slopes, unstable areas, and erosive soils. (LUP)



- P5-210** The City shall develop a water quality checklist to be used in the permit review process to assess potential water quality impacts. (LUP)
- P5-211** Commercial development shall incorporate BMP's designed to minimize or avoid the runoff of pollutants from structures, landscaping, parking, and loading areas. (LUP)
- P5-212** Restaurants shall incorporate BMP's designed to minimize runoff of oil and grease, solvents, phosphates, suspended solids, and other pollutants to the storm drain system. (LUP)
- P5-213** Gasoline stations, car washes, and automotive repair facilities shall incorporate BMP's designed to minimize runoff of oil and grease, solvents, car battery acid, coolant, gasoline, and other pollutants to the storm water system. (LUP)
- P5-214** Storm drain stenciling and signage shall be provided for new storm drain construction in order to discourage dumping into drains. (LUP)
- P5-215** Permits for new development shall be conditioned to require ongoing maintenance where maintenance is necessary for effective operation of required BMP's. (LUP)
- P5-216** The City, property owners, or homeowners associations, as applicable, shall be required to maintain any permitted drainage device to ensure it functions as designed and intended. Owners of these devices shall be responsible for ensuring that they continue to function properly and additional inspections should occur after storms as needed throughout the rainy season. Repairs, modifications, or installation of additional BMP's, as needed, should be carried out prior to the next rainy season. (LUP)
- P5-217** The City, property owners, or homeowners associations, as applicable, shall sweep permitted public and private streets frequently to remove debris and contaminant residue. (LUP)
- P5-218** New development shall include construction phase erosion control and polluted runoff control plans. For example, such plans may include controls on timing of grading, BMP's for storage and disposal of construction materials, or design specifications of sedimentation basins. (LUP)



- P5-219** New development that requires a grading/erosion control plan shall include landscaping and re-vegetation of graded or disturbed areas. (LUP)
- P5-220** The use of efficient irrigation practices and native or drought-tolerant non-invasive plants to minimize the need for fertilizer, pesticides, herbicides, and excessive irrigation will be recommended. (LUP)